

## INTEGRATED MICROFEATURE WORKPIECE PROCESSING TOOLS WITH REGISTRATION SYSTEMS FOR PADDLE REACTORS

### ABSTRACT OF THE DISCLOSURE

Tools having mounting modules with registration systems are disclosed. The mounting module includes positioning elements for precisely locating a processing chamber and a transport system that moves workpieces to and from the processing chamber. The relative positions between positioning elements of the module are fixed so that the transport system does not need to be recalibrated when the processing chamber is removed and replaced with another processing chamber. The processing chamber includes a paddle device for agitating processing liquid at a process surface of the workpiece. The paddle device, the processing chamber, and electrodes within the processing chamber are configured to reduce the likelihood for electrical shadowing created by the paddles at the surface of the workpiece, and to account for three-dimensional effects on the electrical field as the paddles reciprocate relative to the workpiece.